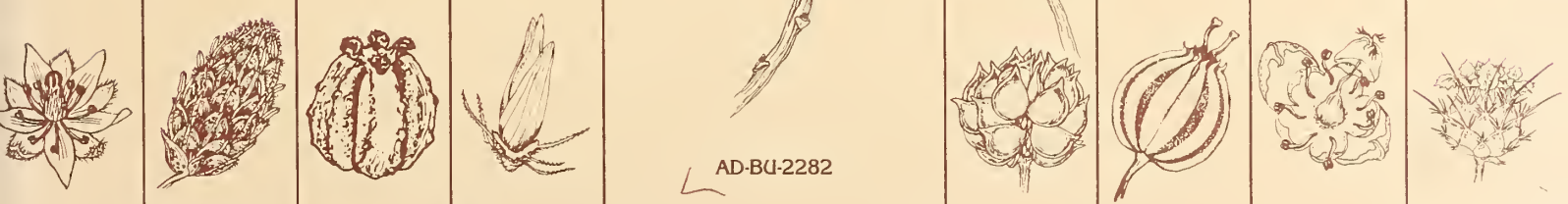
Poison Ivy, Poison Oak, and Poison Sumac

Identification, Poisoning, and Control



AD-BU-2282

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On February 28, 1979, the Environmental Protection Agency announced emergency suspension of uses of 2,4,5-T products on forests, rights-of-way, and pastures and suspension of registered uses for silvex products on forests, rights-of-way, pastures, and home, aquatic, and recreation areas. Cancellation proceedings were initiated at the same time. Decisions on these uses of products will not be known until final action has been taken. During the interim period, these uses are illegal.

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Each year, many people are accidentally poisoned by contact with plants they did not know were harmful. If people knew how to recognize these poisonous plants, they might escape the painful experience of severe skin inflammation. Poison ivy and poison oak afflict outdoor workers and others in almost every state in the continental United States. There are almost 2 million cases of skin poisoning each year. These plants are the greatest single cause of Worker's Compensation claims in the United States, and they are a leading cause of field injuries among workers of the U.S. Forest Service.

People vary widely in their susceptibility to poison oak and poison ivy but few, if any, are completely immune. Poisoning can be avoided, however. People can learn to identify plants in their various forms by studying pictures and general descriptions and can then train themselves by observing plants in their locality. Children can be taught to recognize the plants and can be made aware of the dangers. Safe methods can be used to kill these poisonous plants and thus reduce the risk of exposure in public and private areas such as park trails and playgrounds and in shrubs, hedges, and fences around residences. There is little reason to tolerate this health hazard in such sites.

Poison ivy and poison oak are neither ivy nor oak species. These plants, as well as poison sumac, belong to the cashew family (*Anacardiaceae*) and are known by several local names. The leaf shape and growth habits of poison ivy and poison oak plants vary greatly throughout the United States. Plants can be found in patches along the ground, as shrubs, or as climbing vines. Their common features are their poisonous characteristic and their compound leaves, which consist of three leaflets. The supporting stem of the terminal leaflet is much longer than that of the two lateral leaflets in all species. The old saying "Leaflets three, let it be," is a reminder of one nearly consistent leaf characteristic, but it may lead to undue suspicion of some harmless plants. Also, a few local plants of poison ivy and poison oak may have five or more leaflets. Such plants are exceptions, however, just as four-leaf clovers are exceptions. Poison sumac has 7 to 13 leaflets and thus is not confused with poison ivy or poison oak. The leaves of all three turn yellow to bright red in autumn.

Poison Ivy

Range and Habitat

Poison ivy [*Toxicodendron radicans* (L.) Kuntze], a native woody species with nine subspecies, six of which are found in the United States, is widespread in the humid states but also is found in moist and favored sites in low rainfall areas. Distribution in the United States is below the 44th parallel, extending from Maine to Florida and westward into Nebraska, Kansas, Oklahoma, and Texas. It also grows in a small area in southern Arizona and New Mexico (figure 1). Poison ivy thrives along stream banks, edges of paths and roadways, fencerows, rich woodlands, and other noncultivated sites. It grows where moisture is plentiful and light intensity is adequate. Plants may ramble over rock walls and may climb posts and trees to considerable heights (figure 2). Poison ivy plants often occur under shrub plants or other structures that serve as bird perches. At least 55 species of birds eat the fruit and are responsible for the wide distribution of poison ivy seed.

Leaves, Flowers, and Fruits

The compound leaves of poison ivy are alternate on the stem. Each compound leaf is made up of three leaflets. Each leaflet is 2 to 4 inches long and is pointed at the tip. The supporting stem of the terminal leaflet is much longer than the stems of the two lateral leaflets (figure 3). Leaflets may be glossy or dull green and usually have smooth surfaces. The edges of the leaflets vary

Figure 1. Shading indicates the extensive area in which poison ivy grows.

considerably; some are toothed or even lobed but most are not (figure 3).

In June or July, some poison ivy plants produce small yellowish-green flowers in compact clusters on the side of the stem immediately above a leaf (figure 4A). The grayish-white, waxy fruit of poison ivy is about 3/16 inch in diameter and has distinct lines marking the outer surface, somewhat like a peeled orange (figure 4B). The seed is grayish striped and about 1/8 inch in diameter. Plants that have only male flowers produce no fruit. Fruits are less frequently produced when female plants of poison ivy grow in dense shade or under crowded conditions.

Growth Form

The stems of poison ivy usually are woody except when quite young. Poison ivy commonly grows as a vine, but if it has full sunlight along fencerows or in open fields (figure 5), it may grow as a shrub up to several feet tall. It may grow as a slender vine that runs along the ground, or it may climb fence posts, shrubs, and trees (figure 6). The vine develops many aerial roots along the stem when in contact with the ground or with any object that will support it. When vines grow on trees, these aerial roots attach the vine securely. A rank growth of these roots often causes the vines on trees to have the general appearance of a fuzzy rope. Old vines may be more than 2 inches in diameter and may grow up to 75 feet tall when attached by roots to trees. Such vines may have lateral branches up to 8 feet long.

The plants also produce slender, creeping rootstocks from the base of the stem. The rootstocks may extend underground for a distance of several yards from the parent plant, sending up short, slender, leafy shoots from the nodes.

Rydberg's Poison Ivy

Range and Habitat

Rydberg's poison ivy [*Toxicodenron rydbergii* (Small ex Rydberg) Greene] is the most northerly ranging species of poison ivy. It is the dominant form north of the 44th parallel, but it also can be found in some mountainous areas to within 100 miles of the Mexican border. The general range is shown in figure 7. It also occurs on a few mountain tops in the Appalachian Mountains. Habitats are many and varied. Although Rydberg's poison ivy often is found in wet places like hills, ravines, and near waterfalls, it also has been found on sub-alpine rocks on Pikes Peak (Colorado). It inhabits some of the moist habitats in the prairies and valleys of the Rocky Mountains, and it may find a niche in moist and sunny openings in pine hardwood and other forests. The weedy nature of this plant permits invasion along roads, railroads, lakeshores, floodplains, and fencerows. The level of need for moisture and sunlight determines where it occurs.

Figure 2. Poison ivy growing in a hedge and on a shade tree at the edge of a lawn.

Figure 3. Three poison ivy leaves showing the different leaf shapes that can occur on the same plant. Note for each leaf that the two lateral leaflets have short supporting stems, whereas the terminal leaflet has a long supporting stem. This characteristic is typical of poison ivy and poison oak.

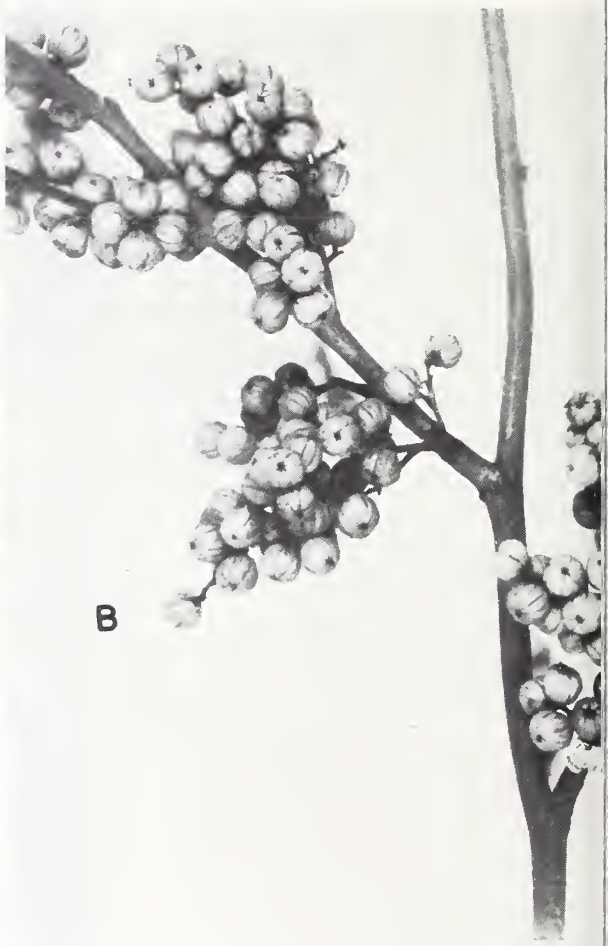

Figure 4. (A) Flowers of poison ivy attached to a branch in axils of the leaves. Leaves are attached to the branch alternately (not opposite). (B) Mature fruit with distinct lines marking the outer surface, rather like the segments of a peeled orange.

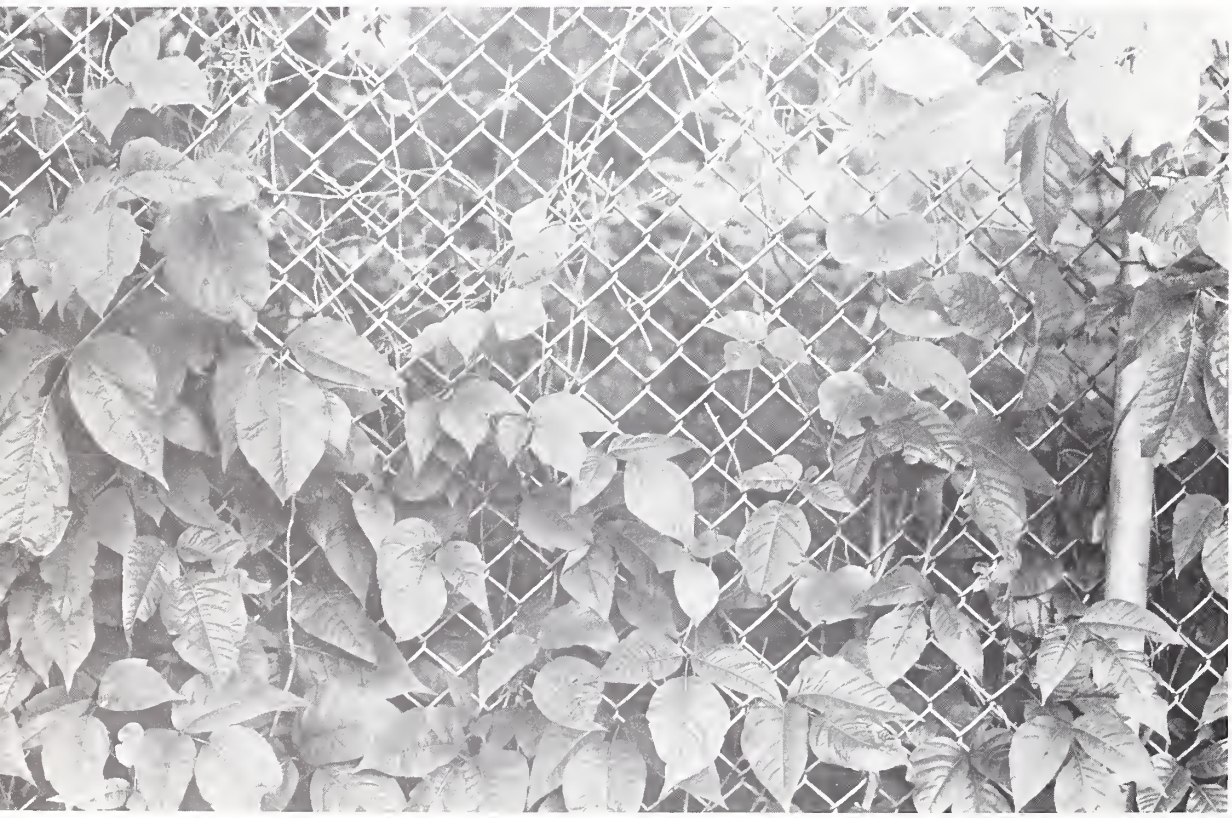

Figure 5. Poison ivy plants growing in a chain-link fence around the backyard of a suburban residence. Such plants are particularly difficult to remove without personal contact and the incidental hazard of being poisoned.

Figure 6. Poison ivy vine attached by roots to the trunk of a tree.

Leaves, Flowers, and Fruits

The compound leaves are usually clustered near the top of the stem. Leaflets are broad and rounded (somewhat spoon-shaped). Leaf stems are not hairy. The fruits of Rydberg's poison ivy tend to be larger and lighter in color than those of other poison ivy plants. The fruiting clusters are rather compact and stand erect.

Growth Form

Rydberg's poison ivy is a dwarf, nonclimbing shrub or subshrub. It does not form aerial roots. Stems usually are simple or have sparse upright branches. The broad, spoon-shaped leaflets arise near the top of the stem. The plant does not usually exceed 3 feet in height, although heights of 9 feet have been recorded. It produces rootstalks, and the many stems growing together on a single site may all be from a single plant.

Poison Oak

Range and Habitat

Poison oak [*Toxicodendron toxicarium* (Salisb.) Gillis], a native woody plant, grows in dry barren areas, sandy wastes, pinewoods, and sandy woods. The range is shown in figure 8.

Leaves, Flowers, and Fruits

Poison oak leaves have three leaflets (sometimes, but rarely, they have five) on erect velvety petioles that are mostly attached near the top of the stem (figure 9). Leaflets have three to seven lobes, somewhat like the leaves of white oak. Leaflet margins may be wavy or almost entire. The lateral leaflets are borne close to the petiole and are irregularly lobed. The terminal leaflet, which is borne on a relatively long stem, is 2 to 3.5 inches long and 1.5 to 2.7 inches wide. The upper sides of

Figure 7. Shading indicates the extensive geographical area in which Rydberg's poison ivy can be found.

Figure 8. Shading indicates where poison oak can be found. Poison ivy species also can be found in the same region.

Figure 9. A poison oak plant growing under blackjack oak trees in sandy soil in Oklahoma.

Figure 10. Poison oak leaves. Note the lobing and the lighter colored undersides of the leaves compared to the darker green color of upper leaf surfaces.

leaflets are dark green and smooth or hairy. The undersides of leaflets appear to be a lighter green because of the presence of dense, velvety-fine hairs (figure 10).

Poison oak flowers, which are produced in May or June, are greenish yellow and are borne on a panicle that is attached to the side of the stem in the leaf axil (figure 11B). The creamy white fruit (Drupe) is hairy when young but is smooth to soft hairy when mature and is about 3/16 inch in diameter. Poison oak seed is hard, grayish, striped, somewhat flattened, and about 1/8 inch diameter. As with poison ivy, seed is dispersed primarily by birds.

Growth Form

Poison oak is a low-growing shrub. It does not climb as a vine nor does it have aerial roots. Stems generally grow upright. Poison oak spreads by underground lateral rootstocks as well as by seed.

Pacific Poison Oak

Range and Habitat

Pacific poison oak [*Toxicodendron diversilobum* (Torr. & Gray) Greene] grows in great abundance along roadsides and in uncultivated fields, on abandoned land, and on rangeland. This native plant tends to increase in abundance when established vegetation is disturbed. It is distributed throughout much of

Figure 11. (A) A poison oak plant. (B,C) Flowers. (D) Fruit. (E) Seed.

Figure 12. Shading indicates the region in which Pacific poison oak and poison sumac are likely to occur.

California, west of the Sierras, and in the desert. It extends into Oregon and Washington between the Coast Range and the Cascades (figure 12). In the Columbia River gorge, the ranges of Pacific poison oak and Rydberg's poison ivy overlap. Evidence of hybridization of these species is abundant, and the hybrids appear to be fully fertile.

Pacific poison oak has perhaps the widest range of habitats among poison oak/poison ivy species. Although it is favored by good soils or rich loams, it grows in blue adobe, in saline soils, in gray soils, in sandy flats, in heavy gravel deposits, and in the crevices of outcropping rock piles. It is adapted to a great range of rainfall and temperature. It is especially remarkable for its extreme shade tolerance as well as for its tolerance of intense sunlight. Its preferred habitat is the moist slopes of hills. It grows at altitudes ranging from sea level to about 5,000 feet.

Leaves, Flowers, and Fruits

Pacific poison oak usually has three leaflets (exceptional plants may have five or more), but the lobing of leaflet margins is very irregular. Most leaflets are lobed somewhat like certain oak species, but some leaflets have merely wavy margins (figures 13 and 14).

The flowers of pacific poison oak are in clusters that arise in the leaf axils. They are greenish white and about ⅛ inch in diameter. The fruits are somewhat larger than other Western Hemisphere poison oak/poison ivy species (up to 5/16 inch in diameter), are greenish or creamy white with a glossy surface, and have deeply furrowed striations and abundant short hairs. Fruits remain on the plants into the winter.

Growth Form

Pacific poison oak grows as an upright shrub that has many small woody stems rising from the ground (figure 15). It sometimes attaches itself by means of aerial roots to upright objects for support, giving it the appearance of a vine. The tendency is for individual branches to continue an upright growth rather than to become entirely dependent on other objects for support. In some woodland areas, 70 to 80 percent of the trees support vines that extend from 20 to 30 feet in height. In open grazing lands, Pacific poison oak usually grows in spreading clumps from a few feet to several feet tall. Extensive growth greatly reduces an area for grazing.

Low-growing plants, especially those exposed to full sunlight, often are quite woody and show no tendency for vining. These plants are common in grazing lands or along roadsides. Pacific poison oak plants spread both by rootstock and by seed.

Plants Sometimes Mistaken for Poison Ivy

Poison ivy can be confused with a number of other woody or vine plants that have three leaflets. Several such plants are described below, along with the differences that distinguish them from poison ivy.

Figure 13 (above, left). Pacific poison oak leaves with the irregular leaf margins often associated with this species. Figure 14 (above, right). A small Pacific poison oak plant with thick leathery leaves that have somewhat wavy leaf margins.

Figure 15. A Pacific poison oak plant growing in an open field as an upright shrub about 6 feet tall. Typically, this plant has many stems and an abundance of fruit.

Box Elder

Box elder is in the maple family and therefore has opposite leaves. Box elder frequently has leaves with five leaflets; some leaves have three. The young stems are bright, glossy green with an occasional whitish-bloom patch. Poison ivy always has brown or dull green young stems and the compound leaves are always alternate. The leaves of poison ivy generally are darker green than the leaves of box elder.

Hop Tree

Hop tree grows as a shrub similar to some forms of poison ivy. It does not have well defined buds as poison ivy does. The tips of hop tree branches are quite stubby. The twigs tend to be gray or black, rather than brown like poison ivy. The leaflets are borne in threes like those of poison ivy, but the terminal leaflet tapers sharply to the base, whereas poison ivy tapers only slightly if at all. All three leaflets of the hop tree are attached directly on the leaf petiole; poison ivy lateral leaflets form on short stems from the petiole, and the terminal leaflet is borne on a much longer stem. The edges of leaflets of hop tree are smooth, or occasionally have fine teeth, but those of poison ivy are either smooth or lobed. The fruits of hop tree have a dry, circular, papery wing surrounding the seed like a wafer. Poison ivy fruits are berry-like.

Bladder Nut

Bladder nut, like the box elder, has opposite leaves with toothed leaflet margins. It has sack-like persistent fruits that may be an inch or more in diameter. It grows like a small tree.

Virginia Creeper

Virginia creeper grows in some of the same habitats as poison ivy, and it has vining habit and climbs as poison ivy does. Virginia creeper, however, has five leaflets radiating from one point of attachment and blue fruits that distinguish it from poison ivy with its three leaflets and white fruits.

Virgin's Bower

Virgin's bower grows as a vine, but it has opposite leaves. The lateral and terminal leaflets are borne on stems of about equal length, whereas poison ivy lateral leaflets have short stems and the terminal leaflet has a relatively long stem. The leaflets of virgin's bower are quite thin and never glossy. The flowers of virgin's bower are conspicuous, cream white, and about ¾ of an inch across.

Aromatic Sumac

Aromatic sumac is related to poison ivy but has leaves more uniform in size. The notches are rounded rather than pointed. The leaves are generally quite hairy, and their leaflets taper to the base, unlike those of poison ivy. The flowers are yellow and appear at the same time as the leaf buds, which open early in April. The fruits are almost ripe by the time poison ivy flowers are coming out. The fruits of aromatic sumac are fuzzy and red.

Poison Sumac

Range and Habitat

Poison sumac [*Toxicodendron vernix* (L.) Kuntze] grows in the eastern third of the United States (figure 12) and usually is associated with swamps and bogs (figure 16). This native plant grows most commonly along the margins of areas with wet acid soil. Isolated plants occasionally are found outside swampy regions. These plants apparently start from seed distributed by birds.

Leaves, Flowers, and Fruits

The compound leaves of poison sumac consist of 7 to 13 leaflets (figure 17) arranged in pairs with a single leaflet at the end of the central stem (rachis). There are no wings (flattened lateral extensions) on the rachis of poison sumac as occurs in shining sumac (figure 18). The leaflets are elongated and oval with smooth edges, are 3 to 4 inches long and 1 to 2 inches wide, and have a smooth velvet-like texture. In early spring the leaves may be bright orange. Later they become dark green and glossy on the upper surface and pale green on the lower; they have scarlet midribs. In early fall, leaves turn to a brilliant red-orange or russet.

The small yellowish-green flowers are borne in clusters on slender stems arising from the axils of leaves along the small branches. Flowers produce ivory-white or green fruits resembling those of poison oak or poison ivy, but they are in less compact panicles and hang in long loose clusters that may be 10 to 12 inches long (figure 19).

Growth Form

Poison sumac grows as a coarse, woody shrub or small tree, never in the vinelike form of its poison ivy relatives. Mature plants range in height from 5 feet to small trees that may reach 25 feet. Poison sumac shrubs usually do not have a symmetrical upright tree-like appearance; rather, they usually lean.

Plants in dry soil are seldom more than a few feet tall, but such single, isolated plants are not readily recognized outside their usual swamp habitat so unsuspecting individuals often are poisoned by them.

Two nonpoisonous sumacs can be confused with poison sumac. **Shining sumac,** like poison sumac, has leaflets with smooth edges, but the rachis is winged. **Smooth sumac** has a rachis without wings, but the leaflets are toothed. Both of these sumacs have red fruit in a compact cluster.

Figure 16. A large poison sumac shrub about 15 feet tall growing on the edge of a swamp.

Figure 17. A small branch of poison sumac with six compound leaves. Poison sumac has 7 to 13 leaflets per leaf.

Figure 18. Shining sumac has leaves somewhat like poison sumac. Shining sumac, however, has winged margins on the midrib; poison sumac does not.

Figure 19. Mature fruits of poison sumac after the leaves have fallen. The fruits of poison sumac are always on drooping slender stems attached at the side of the small branches, never at the end of branches as in the species of sumac that are not poisonous.

Poisoning

Nature of Poisoning

Many people know through experience that they are susceptible to poisoning by poison ivy, poison oak, or poison sumac. Others, however, either have escaped exposure or have a certain degree of resistance. The occurrence of poisoning is greatest in spring and summer.

Sensitivity to poisoning can change with time. In general, persons repeatedly exposed to poison ivy and poison oak become more sensitive because they react to lower concentrations of the oily toxicant. Individuals who don't encounter these plants for several years become less sensitive. People usually become less sensitive as they get older. But these general rules don't always hold true. Persons who have waded through patches of poison oak numerous times without effect can suddenly develop a severe rash after such contact. Occasionally a person becomes less sensitive after a serious bout of poisoning by poison ivy or poison oak.

The sap of these poisonous plants contains an oily toxicant (3-*n*-pentadecyl-catechol) that exists in four degrees of oxidation, all toxic. It causes an allergic reaction on the skin. Contacting the oil sets off a skin eruption that can vary from a simple itching inflammation to water blisters.

The toxic principle is carried in specialized vessels or resin ducts in the phloem of the plants. It normally is not present on the surface of leaves or twigs nor in the stamen or the pollen of the flowers. It is found within the resin ducts in leaves, flowers, stems, or roots in all *Toxicodendron* species. Should the leaves be bruised, chewed by insects, or otherwise damaged, then and only then will the poison exude from the poison ducts onto the leaf surface. This clear fluid changes in a few hours to a black gummy substance. The toxic principle is transferred to human beings either because they break leaves or stems as they brush against the plant or because they touch the blackened substance that has come to the surface of the leaves. The poisons can be toxic for an indefinite period; several-hundred-year-old herbarium specimens have been toxic to sensitive persons who handled them.

Poisoning occurs only when the skin of a sensitive person comes in contact with the poison, either by contact with the plants or contact with some object that carries the poison or through the smoke of burning plants. Clothing, gloves, and tools can become contaminated and often are sources of prolonged infection. Dogs, cats, and livestock frequently contact the plants and carry the poison to children or other unsuspecting persons. The poison can remain on the hair of animals for a considerable time after they have gone through patches of poison ivy.

Cattle, horses, sheep, hogs, and other livestock apparently do not suffer skin irritation from these plants, even though they graze on them occasionally. Poison ivy is heavily browsed by deer. Bees collect nectar from the flowers, but no ill effects from contact with honey have been reported.

Humans can contract the dermatitis by being in the smoke of burning poison ivy, but not for the reasons commonly supposed. The poison is not volatile, even at bonfire temperatures. Any transmission from smoke is by droplets on particles of dust and ash in the smoke, rather than from gas. **Smoke from burning poison ivy plants or contaminated articles can carry the poison in a dispersed form. Take extreme precaution to avoid inhalation or contact of smoke with skin and clothing.**

The time elapsing between contact with the poison and the appearance of inflammation varies with different individuals according to their sensitivity, the amount of poison that has contacted the skin, the temperature, and the season. Symptoms of poisoning usually appear in 12 to 24 hours after exposure, but symptoms sometimes appear within 3 or 4 hours, or they may not appear for several days.

Precautions

Normal field clothing can protect your legs, feet, arms, and hands from contact with plants. It is the unprotected areas—wrists, face, and eyes—that present a problem. You can button your sleeves over your gloves to help reduce exposure of your wrists. Protecting your face is more difficult. You can spread oil that collects on your shirt sleeves simply by wiping sweat from your forehead and eyes. So wear a sweatband or tie a bandana around your forehead to absorb the sweat and keep it out of your eyes. Rinse or wring out your sweatband periodically. Keep your gloves away from your face.

Any type of protective clothing is better than none. But protective clothing has its drawbacks. If the oil gets on your skin and in your sweat, the clothing itself can spread the oil both directly and by promoting sweating. Clothing also can increase the penetration of the poison into your skin. The poison that contacts the inside of your sleeves can be spread up your arms both by direct contact and by sweat.

Contaminated clothing and tools often are difficult to handle without causing further poisoning. Contaminated automobile door handles or steering wheels can cause prolonged cases of poisoning among persons who have not been near the plants. Decontaminate such articles by washing them thoroughly in several changes of strong soap and water. Do not wash contaminated clothes with other clothes. Take care to rinse your washing machine thoroughly.

The oily sap is marginally soluble in water. A little water spreads the oil, but a lot washes it off.

Treatment

One of the best ways to prevent a rash after exposure is to wash the skin thoroughly with cold water. Warm water allows the oil to penetrate more. If the skin can be washed within 1 to 3 minutes after exposure (exact time depends on sensitivity), a rash may be prevented. Even if it is too late to prevent the rash, excess oil should be washed off. Otherwise it remains on the skin, where it can spread. Liberal use of cold water on affected areas can prevent this. Neither the red swollen area nor the blister fluid transmits the rash; only the oil can do so.

No known medicine can protect completely against poison ivy/poison oak rash. A new medication—steroid gels—can minimize discomfort and speed recovery. Steroid gels are the most effective formulations and quickly stop the rash. Also available are steroid creams, lotions, and ointments. Not all doctors may be familiar with steroid gels. If you are exposed to poison oak or poison ivy, ask about topical steroid treatment.

Steroid gels, available by prescription in 10- to 15-gram tubes, should be applied to the skin at the first sign of itching,

redness, or swelling. They should be applied, and in moderation, only to those areas that have been exposed. The gel should be rubbed into the infected area several times each day. Improvement can be seen in about 6 hours. Although treatment should begin at the first symptom, it should not extend beyond 72 hours or after blisters develop. The gel should remain on the skin. Ask your physician to demonstrate its use; it is difficult to describe. The gel generally produces no adverse side effects as long as it remains localized on the skin. Some of the gel is absorbed into the systemic circulation in amounts directly proportional to the area covered.

Systemic steroids are administrered by injection and by pills. This more potent form of medication is indicated when: (a) the rash involves more than a quarter of the body, (b) the face is red and swollen because of exposure to smoke, or (c) a very sensitive person contacts the oil and the face or genitals begin to itch and swell. Systemic steroids can be administered by a physician.

Calamine lotion is probably as good at relieving the itching as anything, apart from steroids. It is especially effective when applied to areas where blisters have formed because it relieves the itching and absorbs the blister fluid. Most other medicines are not very effective.

Control

Mechanical Control

Poison ivy and poison oak plants can be removed by grubbing or hand pulling in areas that contain valuable ornamentals. All precautions discussed above should be followed. Persons who are sensitive to poison ivy and poison oak probably should not attempt hand methods of control. Roots and rootstocks can be removed most easily when the soil is thoroughly wet. Grubbing or pulling when the soil is dry and hard is almost futile because the roots and rootstocks break off in the ground, leaving large pieces that can sprout vigorously later.

Poison ivy vines climbing on trees should be severed at the base, and as much of the vine as possible should be pulled away from the tree. Often the tree roots and poison ivy roots are so intertwined that grubbing is impossible without injuring the tree. Remember that the roots and stems removed during grubbing are poisonous. You can bury them, but it may be more practical to cut the vines and roots into segments and put them in plastic bags for disposal through municipal waste. Be careful not to contact the vines during this process.

A poison ivy seedling 2 months old usually has a root system that a single mowing will not kill. Seedling plants at the end of the first year have well established rootstocks that only grubbing or herbicides will kill. Seedlings become established and can recur as long as old seedbearing poison ivy plants are in the general area.

Mowing with a scythe or sickle is not an efficient means of controlling poison ivy and poison oak. It has little effect on roots unless it is repeated frequently. Plants usually are not found in lawns where repeated close mowing is practiced. Cutting plants and allowing the sap to be exposed can present considerable risk to those who might come in contact with it.

A single plowing is of little value in combating poison ivy and poison oak. But good seedbed preparation and planting cultivated crops such as corn or soybeans for 1 or 2 years will control them.

Weed burners are not practical or efficient for controlling poison ivy and poison oak.

Control With Herbicides

Poison ivy, poison oak, and poison sumac can be killed with herbicides with relatively little danger to the operator. The herbicides used are relatively low in toxicity to man, animals, birds, and other wildlife. The main hazard to the operator is the danger of contacting the poisonous plants being treated. To minimize this hazard, stand at a distance from the plants and apply the herbicide without touching them. Most herbicides are applied to a localized infestation in a spray solution with spray equipment that has a nozzle at the end of a pipe (wand) 18 inches or more in length (figure 20). The greatest danger of poisoning arises from careless handling of poison-ivy-contaminated equipment, gloves, shoes, and clothing after the work is finished.

You can use a field or garden sprayer for applying spray liquid, but a common compressed air sprayer holding 2 to 3 gallons is convenient for small areas and does not waste the spray.

Use moderate pressure, which produces relatively large spray droplets, rather than high pressure, which creates a mist. The object is to wet the leaves of the poison ivy, poison oak, and poison sumac and avoid wetting the leaves of desirable plants. High pressure causes the formation of many fine droplets that can drift to desirable plants. Apply sprays when there is little air movement. There is often less wind in early morning or late afternoon.

A number of herbicides are registered for use in controlling poison ivy, poison oak, and poison sumac. They vary in their effectiveness and some will kill poison ivy selectively without killing grass. Other herbicides tend to kill all vegetation sprayed. Choice of herbicide depends on the kind of sites a particular herbicide is registered for, the effectiveness of the herbicide, whether the herbicide will harm other plants associated with the poison ivy, and the cost of the herbicide. Read the label carefully before using any herbicide!

One application of a herbicide usually does not kill all plants in a stand of poison ivy or poison oak. Retreatment made as soon as the new leaves are fully expanded usually is necessary to kill plants missed the first time and to treat new growth and seedlings. Plants believed dead sometimes produce new shoots after several months. An area under treatment should be watched closely for at least a year and retreated as necessary.

Amitrole

Amitrole (3-amino-*s*-triazole)[1] is one of the more effective herbicides for killing poison ivy, poison oak, and poison sumac.

[1] Trade names include Amitrol-T, Amizol, Weedazol, Amino Triazole Weed Killer, and Cytrol Amitrole-T. Trade names are used in this publication solely for the purpose of providing specific information. Mention of a trade name does not constitute a guarantee or warranty of the product by the U.S. Department of Agriculture or an endorsement by the department over other products not mentioned.

Figure 20. Using a small compressed air sprayer to spray herbicide on a poison ivy plant growing on a fence post.

It should **not** be used where food crops are to be raised within the year of spraying or where livestock are to be grazed. It is applied to the foliage of plants and translocates throughout the plant. Amitrole should be applied to plants after the leaves have attained full size and are growing in soil moist enough to support active growth. Amitrole can kill other plants that it contacts. Use it as a carefully directed spray onto the leaves of poison ivy if there is ornamental shrubbery nearby. The hazard of drift of spray to other plants is less with amitrole than with 2,4-D, silvex, or 2,4,5-T. Amitrole is sold as a water soluble powder and as a liquid to be mixed with water before spraying. It also is available in pressurized aerosol cans ready for use. The latter would be used if there are only a few plants to be treated. Follow the directions on the herbicide container.

Glyphosate

Glyphosate [*N*-(phosphonomethyl)glycine][2] is moderately effective for killing poison ivy and poison oak if it is applied to the foliage of plants in late summer after fruit has formed and provided there is adequate moisture in the soil to support growth. Glyphosate kills or severely injures most kinds of plants contacted by the spray. Use it carefully near shrubbery and flowers, and do not use it in areas with grass that you wish to retain. Glyphosate generally does not act through the soil and has little soil residual toxicity if properly used. Sprayed areas can be reseeded relatively soon after treatment. The herbicide is translocated throughout the plant and kills both roots and tops. Glyphosate is packaged for sale as a liquid to be mixed with water. Follow the directions on the herbicide container.

Ammonium Sulfamate

Ammonium sulfamate (AMS)[3] is effective in killing poison ivy, poison oak, and poison sumac. It usually is applied as a drenching spray to the foliage of plants, although it also is effective when applied on stumps of very large plants. Undissolved crystals can be placed directly on cut stumps. AMS is not

[2]Trade names include Roundup and Kleenup.

[3]Trade names include Ammate X-NI.

selective, so avoid spraying shrubbery, trees, or grass or they will be killed also. AMS is very corrosive to equipment. Wash equipment thoroughly after use to reduce corrosion. Coating surfaces with oil when equipment is not in use also reduces corrosion. AMS is packaged as water soluble crystals. Keep containers closed and protected from moisture. Follow the directions on the herbicide container.

Phenoxy Herbicides

Phenoxy herbicides are selective; they generally kill broadleaf plants with little or no injury to grasses. Included are 2,4,5-T,[4] silvex,[4] and 2,4-D. When applied to the foliage of actively growing plants, the herbicide spray is absorbed and translocated throughout the plant. Soil treatments generally are ineffective. Provided the soil is moist enough to promote growth, treatments can be made any time after plants reach full foliage and until about 3 weeks before they change color in the fall. In California, treat from full leaf stage until annual grasses have dried. Treating at full flowering stage is optimum. In California, treatment ordinarily is ineffective after June because the soil is too dry and poison oak is under moisture stress.

Phenoxy herbicides also can be applied undiluted to the stump remaining after severing the base of large poison ivy and poison oak plants that have climbed in trees. Also, the foliage of regrowth from such cut stumps can be sprayed when leaves attain full size.

2,4,5-T [(2,4,5-trichlorophenoxy)acetic acid][4] is the most effective phenoxy herbicide for controlling poison ivy, poison oak, and poison sumac. It is the herbicide of choice on grazing lands both because of its effectiveness and its selectivity. It can kill poison ivy and poison oak without significant injury to rangeland grass. Minute quantities of spray drift can severely injure nearby sensitive crops and ornamental plants.

Silvex [2,(2,4,5-trichlorophenoxy)propionic acid][4] is nearly as effective as 2,4,5-T in killing poison ivy, poison oak, and poison sumac. It also is selective, allowing range grasses to continue growth. Follow precautions to reduce spray drift.

2,4-D (2,4-dichlorophenoxyacetic acid) is only moderately effective for controlling poison ivy and poison oak. It does not kill grasses growing in the areas sprayed. 2,4-D often is used in mixtures with other phenoxy herbicides. It is most effective when used at about the full flower or early full leaf stage of growth, when plants are growing actively.

Precautions

Herbicides are relatively safe when they are stored, handled, mixed, and used in accordance with label instructions and sound agricultural practices. Most herbicides are low in toxicity. Some, however, can cause injury to man, domestic animals, and fish and wildlife if improperly used.

Most herbicides are toxic to many crops and ornamentals. Many are volatile and their vapors and spray drift can cause damage to desirable plants. Avoid spraying when windy conditions exist.

Keep herbicides away from children, livestock, and pets. Store herbicides in closed, well-labeled containers in a dry place where they cannot contaminate food, feed, or water.

Wear clean, dry clothing when using herbicides. Launder clothing after each spraying operation.

Do not inhale herbicides, and avoid contact with spray mist and drift. Avoid repeated or prolonged contact of herbicide with your skin and do not allow contact with your eyes, nose, and mouth. If you spill herbicide on your body, remove contaminated clothing and wash the herbicide off with soap and water immediately.

To protect fish, wildlife, and livestock, do not clean spraying equipment or dump excess spray material near lakes, streams, or ponds.

Empty herbicide containers may be hazardous. Dispose of them in accordance with label instructions and the recommendations of your state and local regulatory authorities.

[4]See note on inside cover regarding suspended uses.

December 1983

Published and distributed in cooperation with the Extension Service, U.S. Department of Agriculture, Washington, D.C.

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